S/122/60/000/010/006/015
A161/A030

Raising the Fatigue Resistance of Shafts by Strengthening Turning

Fig.1: Torsion shaft of "T-38" tractor

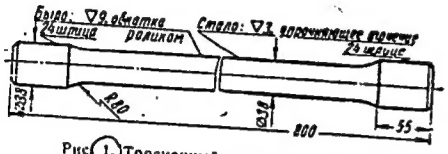
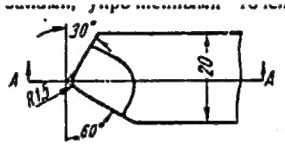


Рис (1.) Торсионный вал трактора Т-38.

Fig.2: Special cutter for strengthening turning



(2)

Card 3/3

SHTEYNBERG, I.S.; TARASENKO, N.V.; KUZNETSOV, V.I.; LUTOV, V.M.

Letters to the editor. Stan. i instr. 31 no.5:38 My '60.
(MIRA 14:5)

1. Zamestitel' glavnogo tekhnologa Lipetskogo traktornogo zavoda (for Shteynberg) 2. Nachal'nik laboratorii rezaniya Lipetskogo traktornogo zavoda (for Tarasenko). 3. Starshiye inzhenery Lipetskogo traktornogo zavoda (for Kuznetsov, Lutov).
(Lipetsk—Metal cutting)

SHTEYNBERG, I.S.

Strengthening torsion shafts of the T-38 tractor by turning them on lathes. Trudy Sem.po kach.poverkh. no.5:71-78 '61.
(MIRA 15:10)

(Surface hardening)

SHTEYNBERG, Isaak Yakovlevich; POSTERNYAK, Ye.F., inzh., red.; FREGER, D.P., red. izd-va; GVIRTS, V.L., tekhn. red.

[Modernization and automation of metal-cutting equipment of the "Vulkan" Plant in Leningrad] Modernizatsiia i avtomatizatsiia metalloobrabatyvaiushchego oborudovaniia na Leningradskom zavode "Vulkan." Leningrad, 1961. 23 p. (Leningradskii Dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Modernizatsiia, avtomatizatsiia i remont oborudovaniia, no.1)
(MIRA 14:10)

(Leningrad--Machine tools) (Automation)

YEL'YASHEVICH, M.G.; ZOZULYA, I.I.; SHTEYNBERG, I.Ye.; SERGEYEV, A.P.; LOKSHIN, M.A.; SHCHEPIN, N.N.

Increasing the efficiency of slurry flotation. Koks i khim. no.9: 18-19 '63. (MIRA 16:9)

1. Donetskiy politekhnicheskiy institut (for Yel'yashevich, Zozulya, Shteynberg). 2. Makeyevskiy koksokhimicheskiy zavod (for Sergeyev, Lokshin, Shchepin).

(Coal Preparation)

SHTEYNBERG, L.A.

137-58-5-10247

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 5, p 194 (USSR)

AUTHOR: Shteynberg, L.A.

TITLE: Obtaining Plating Thickness Control Specimens (Polucheniye kontrol'nykh obraztsov tolshchin gal'vanicheskikh pokrytiy)

PERIODICAL: Radiotekhnich. proiz-vo, 1957, Nr 8, p 40

ABSTRACT: A simple method for obtaining control specimens of platings of specified thickness is suggested. Sized 20-micron Cu foil is employed to obtain the control specimens. A 200x140-mm sheet of foil is bent in half, and the outer sides are then folded under several times into 4-5 mm strips, making it impossible for the electrolyte to penetrate the pack. After degreasing, the specimen is immersed in the bath and held unti 20-25 microns of coating have been deposited, whereupon it is washed in water and dried. A specimen (50x50 mm) is cut out of the middle of the pack and is separated into two thin sheets, each plated on one side. The surface of the control specimens thus obtained is divided into squares of 3x3 mm, and the thickness of the plating on each side is determined by optical indicator or indicating thickness gage. 1. Electroplating--Control systems L.A.

Card 1/1

SHTEYNBERG, L.A., inzh.; GENDLER, A.Kh., inzh.; STUPACHENKO, Yu.T., inzh.

Composition based on epoxy resins with a nontoxic hardener for correcting casting defects. Mashinostroenie no.4:70-71 Jl-Ag '65. (MIRA 18:8)

SHTEYNBERG, L.B., inzh.

Equilibrating hinged crane booms. Trudy TSNIIMF no.11:104-108 '57. (MIRA 11:2)
(Cranes, derricks, etc.)
(Machinery, Kinematics of)

SHTEYNBERG, L.B., inzh.

Balancing crane beams. Stroi.i dor.mashinostr. 4 no.10: 13-14 O '59. (MIRA 13:2)
(Cranes, derricks, etc.) (Balancing of machinery)

MAK, S.L., kand.tekhn.nauk, dotsent; SHTEYNBERG, L.B., inzh.

Determining bending stresses in wires of a steel cable. Izv.vys.-ucheb.zav.; mashinostr. no.7:64-70 '61. (MIRA 14:9)

1. Odesskiy politekhnicheskiy institut.
(Cables)

MAK, S.L.; TULENKOV, F.K.; SHTEYNBERG, L.B.; BERSHAK, V.I.; SERGEYEV, S. I.; GUDIMENKO, A.I.; DAVYDOV, A.M.

Exchange of experience. Zav.lab. 28 no.1:114-115 '62.
(MIRA 15:2)

1. Odesskiy politekhnicheskiy institut i Odesskiy zavod stal'nykh kanatov (for Mak, Tulenkov, Shteynberg). 2. Gosudarstvennyy nauchno-issledovatel'skiy institut tsvetnykh metallov (for Bershak, Gudimenko, Davydov).
(Testing machines)

GUTKIN, L.V., kandidat tekhnicheskikh nauk; SHTEYNBERG, L.D., inzhener.

Repairing locomotive engines on the British railroads. Elek.i tepl.tiaga no.9:45-47 S '57. (MIRA 10:10)
(Great Britain--Locomotives--Repairs)

SHTEYNBERG, L.D., inzh.

Results of the study of the working conditions of the diesel engine crank roller bearings. Vest. TSNII MPS 20 no.4:32-35 '61. (MIRA 14:7)

1. Institut kompleksnykh transportnykh problem AN SSSR.
(Diesel enginos) (Roller bearings—Testing)

SHTEYNBERG, L.D., inzh.

Temperature conditions of the operation of crankshaft bearings of diesel engines. Vest. TSNII MPS 22 no.2:28-31 '63. (MIRA 16:4)

1. Institut kompleksnykh transportnykh problem Gosplana SSSR.
(Bearings (Machinery)—Testing) (Diesel engines)

TRUBETSKOV, K.M., kand.tekhn.nauk; KORNFEL'D, V.N., kand.tekhn.nauk
GREKOV, Ye.A., inzh.; VCYTOV, A.O., inzh.; SHTEYNBERG, L.S., inzh.;
LOMTATIDZE, G.A., inzh.

Investigating the melting of the open-hearth furnace charge with various methods of using oxygen [with summary in English]. Stal' 21 no.3:214-222 Mr '61. (MIRA 14:6)
(Open-hearth furnaces) (Oxygen--Industrial applications)

KORNFEL'D, V.N., kand.tekhn.nauk; VOYTOV, A.O., inzh.; SHTEYNBERG, L.S., inzh.; GREKOV, Ye.A., inzh.

Control of open-hearth furnace smelting by the composition and temperature of combustion products. Stal' 21 no.10:950-958 O '61. (MIRA 14:10)

1. TSentroenergochermet i TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.
(Open-hearth furnaces--Combustion)

KORNFEL'D, Vladimir Naumovich; VOYTOV, Anatoliy Olimpiyevich; SHTEYNBERG, Leonid Solomonovich

[Heat processes in open-hearth furnaces using oxygen] Teplovaia rabota martenovskoi pechi s primeneniem kisloroda. Moskva, Metallurgiia, 1964. 327 p. (MIRA 17:12)

GARCHENKO, T.; BALAKIN, F.N.; YEFIMOV, L.M.; POGORELYY, V.P.; GREKOV, Ye.A.; KORKOSHKO, N.M.; VORONOV, Yu.F.; POLTAVETS, Ye.I.; VOYTOV, A.O.; SHTEYNBERG, L.S.

Production of steel in large-capacity open-hearth furnaces with blowing of oxygen through the bath. Stal' 25 no.2:116-121 F '65. (MIRA 18:3)

SHTEYNBERG, M., kapitan

Operations of mobile blocking detachments in the mountains and in the desert. Voen. vest. 42 no.11:89-91 N '62. (MIRA 16:10).

(Obstacles (Military science))

SHTEYNBERG, M. A.

36991. Spektrograficheskaya i Klinicheskaya Otsenka Fotozashchitnykh Sredstv. Uchen, Zapiski (L'vovsk. Nauch.-issled. Kozhno-venerol. In-t), t. II, 1949, c. 68-72

SO: Letopis' Zhurnal'nykh Statey, Vol 50, Moskva, 1949

SHTEYNBERG, M. A.

36989. Rol' Nikotinovoy Kislot' v Patogeneze i Terapii Kozhnykh Bolezney. Uchen. Zapiski (L'vovsk. Nauch,-issled. Kozhno-venerol. In-t), t. II, 1949, c. 84-88

SO: Letopis' Zhurnal'nykh Statey, Vol 50, Moskva, 1949

SHTEYNBERG, M. A.

36990. Sluchay Sloistoy Puzyrchatki u Beremennoy Zhenshchiny. Uchen. Zapiski (L'vovsk, Nauch.-issled. Kozhno-venerol. In-t), t. II, 1949, c. 97-100

SO: Letopis' Zhurnal'nykh Statey, Vol 50, Moskva., 1949

SHTEYNBERG, DOCENT M. A.

Novocaine

Intracutaneous novocaine anesthesia of the trigeminal nerve endings in lupus erythematosus. Vest. ven. i derm. No. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

SHTEYNBERG, M.A.

USSR/Pharmacology. Pharmacognosy. Toxicology - Local Anaesthetics. T-4

Abs Jour : Referat Zhur - Biologiya, No 16, 1957, 71713

Author : Shteinberg, M.A., Pankova, E.E., Tsarik, S.Ya.
Inst :
Title : The Changes in Censor Chronaxia in Lupus Erythematosus Patients in Treatment with Novocaine Block of the Trigeminal Nerve Endings.

Orig Pub : Vestn. Venerol. i Dermatol, 1956, No 5, 14-15

Abstract : 23 patients with Lupus etythematosus (LE) were treated with novocaine (I). I was injected intradermally in 0.25-0.5 percent solutions, 1.2-0.4 ml each in 2-3 days (altogether 6-12 injections). Clinical recovery occured in 9 patients. In a considerable number of patients a correlation between the clinical reaults and the changes in the censor chronaxia were found.

Card 1/1 - 42 -

SHTEYNBERG, M.A., doktor meditsinskikh nauk

Comparative rating of agents serving as light filters. Vrach.delo no.8:879 Ag '57. (MLRA 10:8)

1. L'vovskiy nauchno-issledovatel'skiy kozhno-venerologicheskiy institut
(LIGHT FILTERS)

SHTEYNBERG, Mark Abramovich

[Photodermatism] Fotodermatozy. Moskva, Medgiz, 1958.
130 p. (MIRA 12:6)
(SKIN--DISEASES)

SHTEYNBERG, M.A., doktor med.nauk; DOVZHANSKIY, S.I.

Treatment of chronic pemphigus with steroid hormones. Vrach.delo no.1:1313 D '58. (MIRA 12:3)

1. Kafedra kozhnykh i venericheskikh bolezney (zav. - prof. A.A. Shteyn) L'vovskogo meditsinskogo instituta i L'vovskiy oblastnoy kozhno-venerologicheskiy dispanser.
(PEMPHIGUS) (STEROIDS)

USSR/Human and Animal Physiology (Normal and Pathological) T
Skin.

Abs Jour : Ref Zhur Biol., No 6, 1959, 27121

Author : Shteynberg, M.A., Tribul'skaya, Z.F.
Inst : -
Title : Light-Protective Properties of Benzoic and Salicylic Acid Derivatives

Orig Pub : Vestn. dermatol. i venerol., 1958, No 3, 8-14

Abstract : Comparison of data of spectrographic investigation and biologic action demonstrated that those light-protective creams and solutions are effective in which active light-absorbing substances are equally distributed and assure maximum absorption of ultra-violet rays of erythemic action. The degree of protection also depends on the thickness of the layer. Light protective action is induced by paraaminobenzoic acid, novacain, anesthesin, sulfonilamides, PAS, salol, salicylic acid and sodium

Card 1/2

SHTEYNBERG, M.A., doktor med.nauk, DOVZHANSKIY, S.I., GURA, M.R., BRODSKIY, Ya.I.

Gephosulfoiodal in treating epidermophytosis of the foot.
Vrach.delo no.6:649 Je '58 (MIRA 11:7)

1. L'vovskiy oblastnoy i gorodskoy kozhnovenerologicheskiye dispansery.
(DERMATOMYCOSIS)

SHTEYNBERG, M.A., doktor med.nauk; KOVALISHINA, T.G.; DOVZHANSKIY, S.I.; TRIBUL'SKAYA, Z.F.

Zonal ultraviolet erythemotherapy in dermatology. Sov.med. 24 no.1:134-135 Ja '60. (MIRA 13:5)

1. Iz L'vovskogo oblastnogo kozhno-venerologicheskogo dispansera (nauchnyy rukovoditel' - doktor med.nauk M.A. Shteynberg, glavnyy vrach T.G. Kovalishina).
(DERMATOLOGY therapy)
(ULTRAVIOLET RAYS therapy)

SHTEINBERG, M.A.; KOVALISHINA, T.G.; DOVZHANSKII, S.I.

Cortisone cream in the treatment of eczema. Vest. derm. i ven. 34 no. 5:63-65 '60. (MIRA 14:1)

(CORTISONE) (ECZEMA)

SHTEYNBERG, M.A.

Significance of porphyrinuria and vitamin PP deficiency in experimental and clinical skin pathology. Vest.derm.i ven. 34 no.8:15-20 '60. (MIRA 13:11)

1. Iz kafedry dermatologii (zav. - prof. A.A. Shteyn) L'vovskogo meditsinskogo instituta (dir. - prof. L.N. Kuzmenko) i Oblastnogo venerologicheskogo dispansera (zav. T.G. Kovalishina).
(PORPHYRINURIA) (VITAMINS—PP) (SKIN—DISEASES)

SHTEYNBERG, M.A., doktor med.nauk

Clinical forms and treatment of systemic lupus erythematosus. Vrach. delo no. 1:115-116 '61. (MIRA 14:4)

1. Kafedra (zav. - prof. A.A. Shteyn) L'vovskogo meditsinskogo instituta.

(LUPUS)

SHTEYNBERG, M.A.; FAYER, Yu.I.; GOL'DENBERG, M.Yu.

Use of prednisone ointment in the treatment of some dermatoses.
Vrach. delo no.9:109 S '61. (MIRA 14:12)

1. Drogobychskiy kozhno-venerologicheskiy dispanser (nauchnyy rukovoditel' - professor M.A.Shteynberg).
(SKIN--DISEASES) (PREGNADIENEDIONE)

SHTEYNBERG, M.A.; FAYER, Yu.I.; GOL'DENBERG, M.Yu.

Structure and dynamics of the incidence of skin diseases data from the Drogobych Dermatovenereological Clinic collected during 10 years. Vest.derm.i ven. 35 no.1:68-72 Ja '61. (MIRA 14:3)

1. Iz Drogobychskogo kozhno-venerologicheskogo dispansera (glavnyy vrach - kand.med.nauk M.Yu. Gol'denberg, nauchnyy rukovoditel' - prof. M.A. Shteynberg).
(DROGOBYCH—SKIN—DISEASES)

SHTEYNBERG, M.A., prof.

Fluorescence diagnosis of some skin diseases. Vest. derm. i ven. 36 no.10:17-22 0'62 (MIRA 16:11)

1. Iz kafedry dermatologii (zav. - prof. A.A. Shteyn) L'vovskogo meditsinskogo instituta i Oblastnogo dermato-venerologicheskogo dispansera (glavnyy vrach T.G.Kovalishina).

*

SHTEYNBERG, M.A., prof.

Diagnostic significance of the luminescence method in skin diseases. Vrach.delo no.10:138-139 O '62. (MIRA 15:10)

1. Kafedra dermatologii (zav. - prof. A.A.Shteyn) L'vovskogo meditsinskogo instituta i Oblastnoy dermato-venerologicheskiy dispanser, L'vov.

(SKIN--DISEASES) (LUMINESCENCE)

SHTEYNBERG, M.A., prof.; TRIBUL'SKAYA, Z.F., vrach.

Short-wave ultraviolet therapy of seborrhea and acne with the KUF-3 lamp. Vest. derm. i ven. 37 no.4:70-71 Ap '63. (MIRA 17:5)

1. Fizioterapevticheskiy kabinet L'vovskogo oblastnogo kozhno-venerologicheskogo dispansera (glavnyy vrach T.G. Kovalishina).

SHTEYNBERG, M.A., prof.; CHERIKOVER, Ya.A.

Rheumatic fever and the skin. Vest. derm. i ven. 38 no.1:22-25 Ja '64. (MIRA 17:8)

1. Kozhno-venerologicheskoye otdeleniye (nachal'nik - kand. med. nauk G.S. Brandorf) Doroshnoy bol'nitsy (nachal'nik P.S. Chernizova) L'vovskoy zheleznoy dorogi i L'vovskiy oblastnoy venerologicheskiy dispanser (glavnyy vrach - kand. med. nauk T.G. Kovalishina).

BARKHATOVA, K.A.; SHTEYNBERG, M.K.

Study of the open star cluster NGC 6939. Sbor.rab. po astron. no.1:14-32 '63. (MIRA 18:1)

SHTEYNBERG, M.M.

Immunologic studies of antigen complexes isolated from typhoid bacilli (O-901) by trypsin digestion and trichloroacetic acid extraction. I. M. Khabas, S. B. El'kin, and M. M. Shteinberg (Div. Biochem., Inst. Vaccines and Serums MZ U.S.S.R., Leningrad). *Biokhimiya* 19, 167–73 (1954).—Tryptic digestion and Cl_3CCOOH extn. of typhoid bacilli, strain O-901, yielded antigenic fractions A, B, C, and T. Chemically and antigenically these can be classed as true antigens. From the view-point of biol. activity these preps. differ markedly from one another in relation to the quant. content of their components. The contrast is greatest between A (which is easily extd. with Cl_3CCOOH) and C, which is rather firmly attached to the substance of the microbial cell. Fraction A possesses a max. absorption in the region of 260 mμ; it contains a higher percentage of N and a lower content of reducing sugars; it is also less toxic and more immunogenic. B. S. Levine

SHTEYNBERG, M.M.; VORONOV, A.S., starshiy elektromekhanik

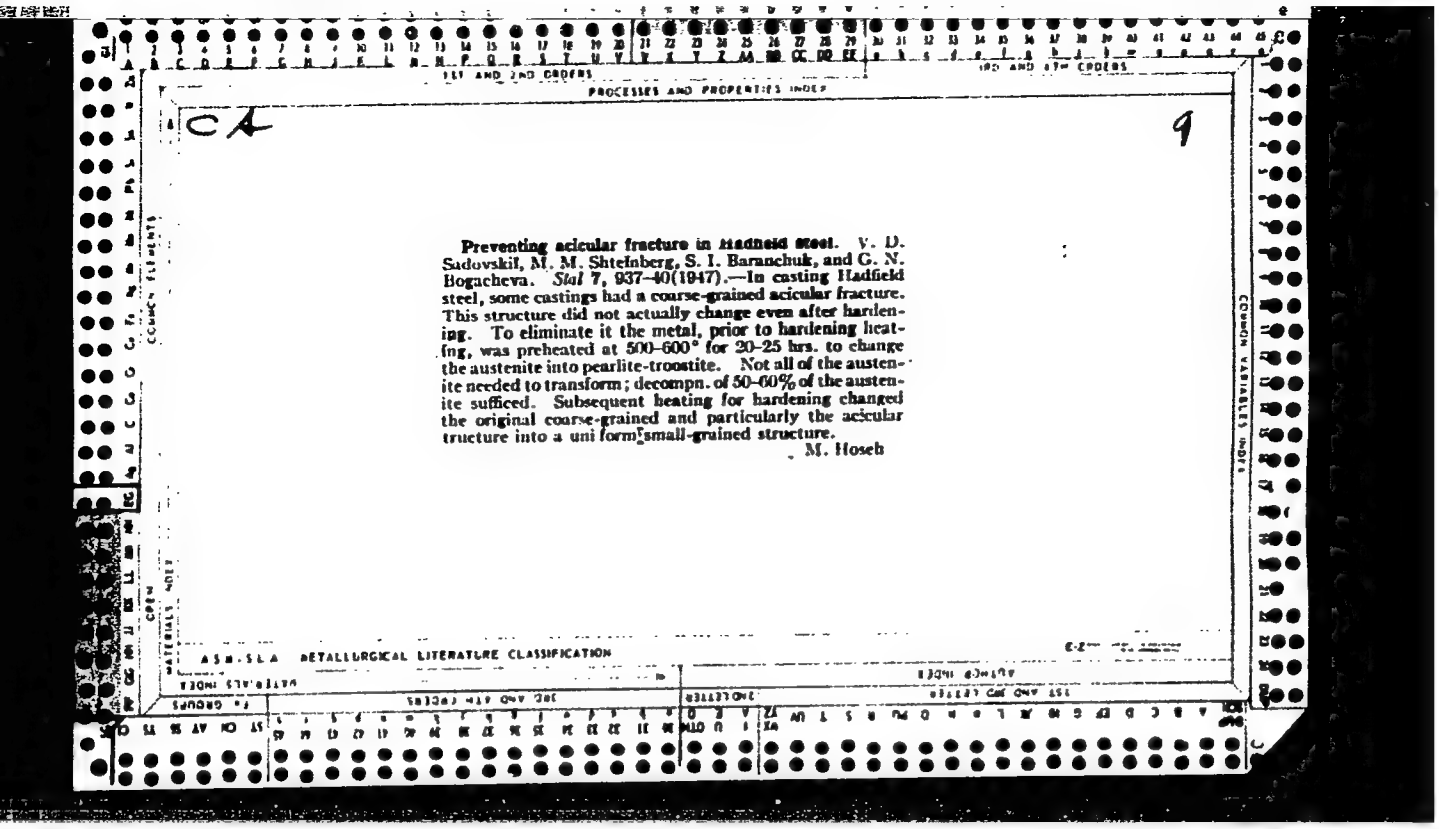
What should a signaling and communications district be like?
Avt., telem. i sviaz' 5 no.1:17 Ja '61. (MIRA 14:3)

1. Nachal'nik otdela signalizatsii i svyazi Akmolinskogo otdeleniya Kazakhskoy dorogi (for Shteynberg). 2. Pologskaya distantsiya signalizatsii i svyazi Stalinskoy dorogi (for Voronov).
(Railroads--Signaling)

SHTEYNBERG, M.M., kandidat tekhnicheskikh nauk.

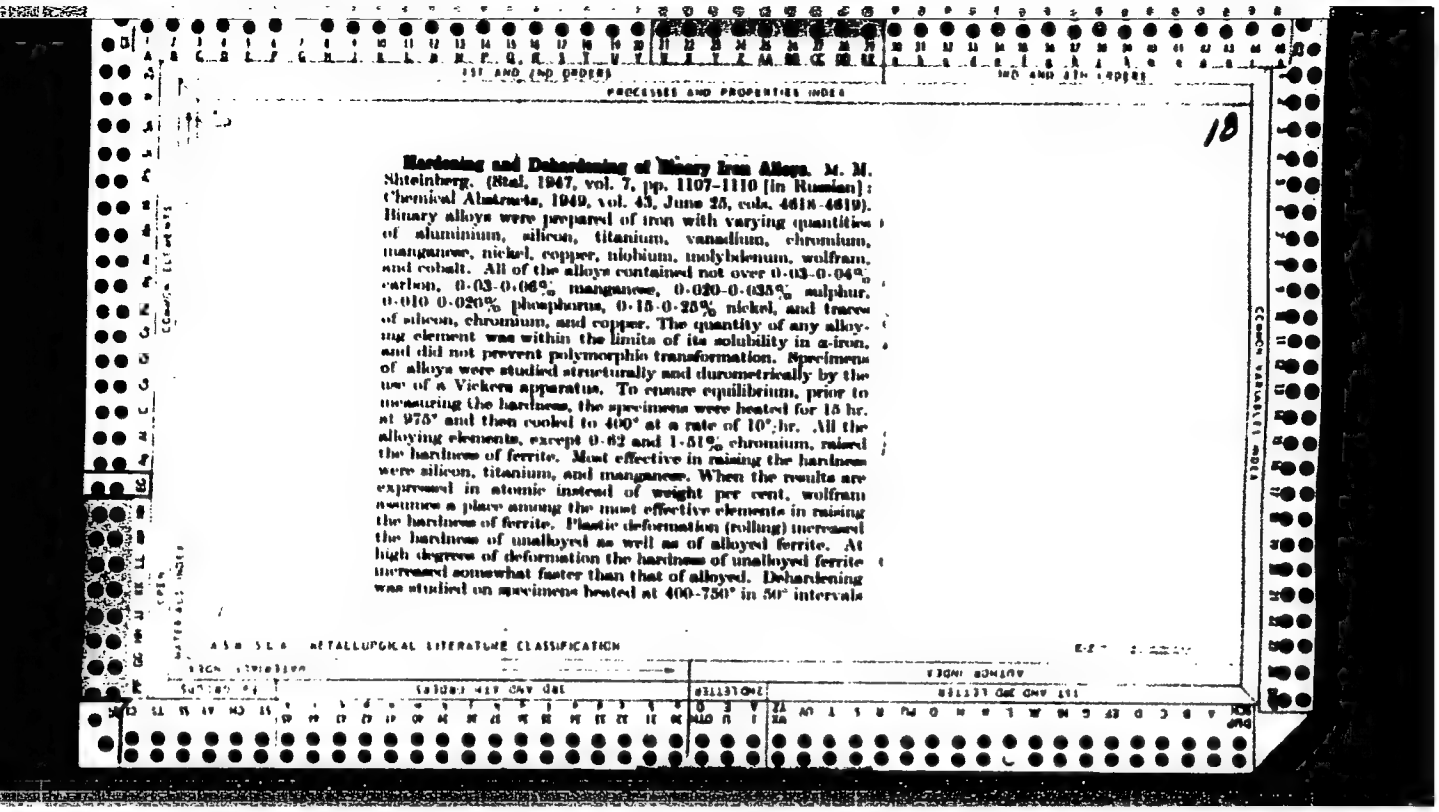
Sensitivity of structural steels to temper brittleness. Stal' 7 no.2:143-146 '47. (MLRA 9:1)

1.Ural'skiy industrial'nyy institut.
(Steel--Brittleness)



Preventing acicular fracture in Hadfield steel. V. D. Sadovskii, M. M. Shteinberg, S. I. Baranchuk, and G. N. Bogacheva. *Stal* 7, 937–40(1947).—In casting Hadfield steel, some castings had a coarse-grained acicular fracture. This structure did not actually change even after hardening. To eliminate it the metal, prior to hardening heating, was preheated at 500–600° for 20–25 hrs. to change the austenite into pearlite-troostite. Not all of the austenite needed to transform; decompn. of 50–60% of the austenite sufficed. Subsequent heating for hardening changed the original coarse-grained and particularly the acicular tructure into a uniform small-grained structure.

M. Hoseh



PROCESSES AND PROPERTIES INDEX

18

Hardening and Dehardening of Binary Iron Alloys. M. M. Shteinberg. (Stal, 1947, vol. 7, pp. 1107–1110 [in Russian]: Chemical Abstracts, 1949, vol. 43, June 25, cols. 4618–4619). Binary alloys were prepared of iron with varying quantities of aluminium, silicon, titanium, vanadium, chromium, manganese, nickel, copper, niobium, molybdenum, wolfram, and cobalt. All of the alloys contained not over 0·03–0·04% carbon, 0·03–0·06% manganese, 0·020–0·035% sulphur, 0·010–0·020% phosphorus, 0·15–0·25% nickel, and traces of silicon, chromium, and copper. The quantity of any alloying element was within the limits of its solubility in α-iron, and did not prevent polymorphic transformation. Specimens of alloys were studied structurally and durometrically by the use of a Vickers apparatus. To ensure equilibrium, prior to measuring the hardness, the specimens were heated for 15 hr. at 975° and then cooled to 400° at a rate of 10°/hr. All the alloying elements, except 0·62 and 1·51% chromium, raised the hardness of ferrite. Most effective in raising the hardness were silicon, titanium, and manganese. When the results are expressed in atomic instead of weight per cent, wolfram assumes a place among the most effective elements in raising the hardness of ferrite. Plastic deformation (rolling) increased the hardness of unalloyed as well as of alloyed ferrite. At high degrees of deformation the hardness of unalloyed ferrite increased somewhat faster than that of alloyed. Dehardening was studied on specimens heated at 400–750° in 50° intervals

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

for 1 hr., then cooled to 350° at a rate of 20°/hr., and finally in air. Dehardening was also studied on specimens rolled to 95% deformation and then heated for various periods at 550, 600°. At 550°, alloys with a minimum content of 0·35% niobium, 0·32% molybdenum, and 0·54% wolfram lost none of their hardness, regardless of time of heating. Alloys of nickel dehardened faster than unalloyed ferrite. At 600°, all alloys except those of niobium, molybdenum, and wolfram lost their hardness almost at the same rate as did unalloyed ferrite. The effect of wolfram, niobium, and molybdenum in arresting dehardening was very pronounced at 650°. At 550°, unalloyed ferrite recrystallised after 30 min., nickel alloys after 20-40 min., silicon alloys after 50 min., and manganese alloys after 60 min. Alloys of aluminium, copper, chromium, and cobalt did not recrystallise entirely even after 12 hr. At 600°, alloys of aluminium and copper recrystallised after 10 min. and chromium and cobalt alloys after 30-40 min. Alloys of 0·35% niobium, 0·32% and 1·93% molybdenum, and 0·54% wolfram recrystallised only partly at 600°, while alloys with 0·9% niobium and 2·11% wolfram did not recrystallise at all. At 650°, alloys of 0·9% niobium and 0·54% wolfram recrystallised partly, while an alloy of 2·11% wolfram did not recrystallise.

CA

Effect of thermal treatment on the hardness of binary iron alloys. M. M. Slatenberg. *Stal* 8, 812 17(1938). The alloys studied were previously described (*C.A.* 43, 4618h). Specimens 10 × 10 and 1 mm. thick were annealed in H for 50 hrs. at 1050° and then cooled to 400° at a rate of 10° per hr. After this treatment the C content did not exceed 0.01%. All the tested elements raised the hardness of ferrite. Most effective were the elements of which the at. radius differed most from that of Fe or which crystd. in a system different from Fe. Alloy specimens were heated in a molten Pb bath to various temps. between 500 and 1200° for 2 min. and then water-cooled. Considerable increase in hardness was induced only when the hardening took place at a temp. above the lower limit of the crit. region. The effect of the concn. of alloying elements on the hardness of alloys hardened from 1200° is of the same general character as on unhardened ferrite. The only exceptions were Cr, Si, and Al; the effect of Cr after hardening rose sharply with concn. and that of Si and Al decreased. The elements Cb, Ti, Cr, Mo, and V were most effective in increasing the hardness of ferrite on hardening, while W, Cu, Co, Ni, and Mn were less effective. The main reason for the increase in hardness of alloyed ferrite upon hardening is attributed to the vol. changes accompanying phase transformation. Specimens hardened from 1300° were tempered at 50-900°. All of the alloys lost some of their hardness upon tempering. The decrease in hardness of alloys which rose only slightly upon hardening was gradual. The hardness of alloys which had a considerable rise upon hardening dropped sharply upon tempering. The hardness of Cb, V, and 0.68% Cu alloys increased after tempering at 400–650°.

M. Hosch

SHTEYNBERG, M.M.

21767 SHTEYNBERG, M.M. Mekhanicheskiye svoystva legirovannogo ferrita. V SB: Problemy donsturdtsionnoy stali. M.L., 1949, S. 54-67.

SO: Letopis'Zhurnal'nykh Statey, No. 29, Moskva, 1949

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 352 - I

BOOK Call No.: TN672.V8

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Transliterated Title: Mekhanicheskiye svoystva slozhnolegirovannogo ferrita

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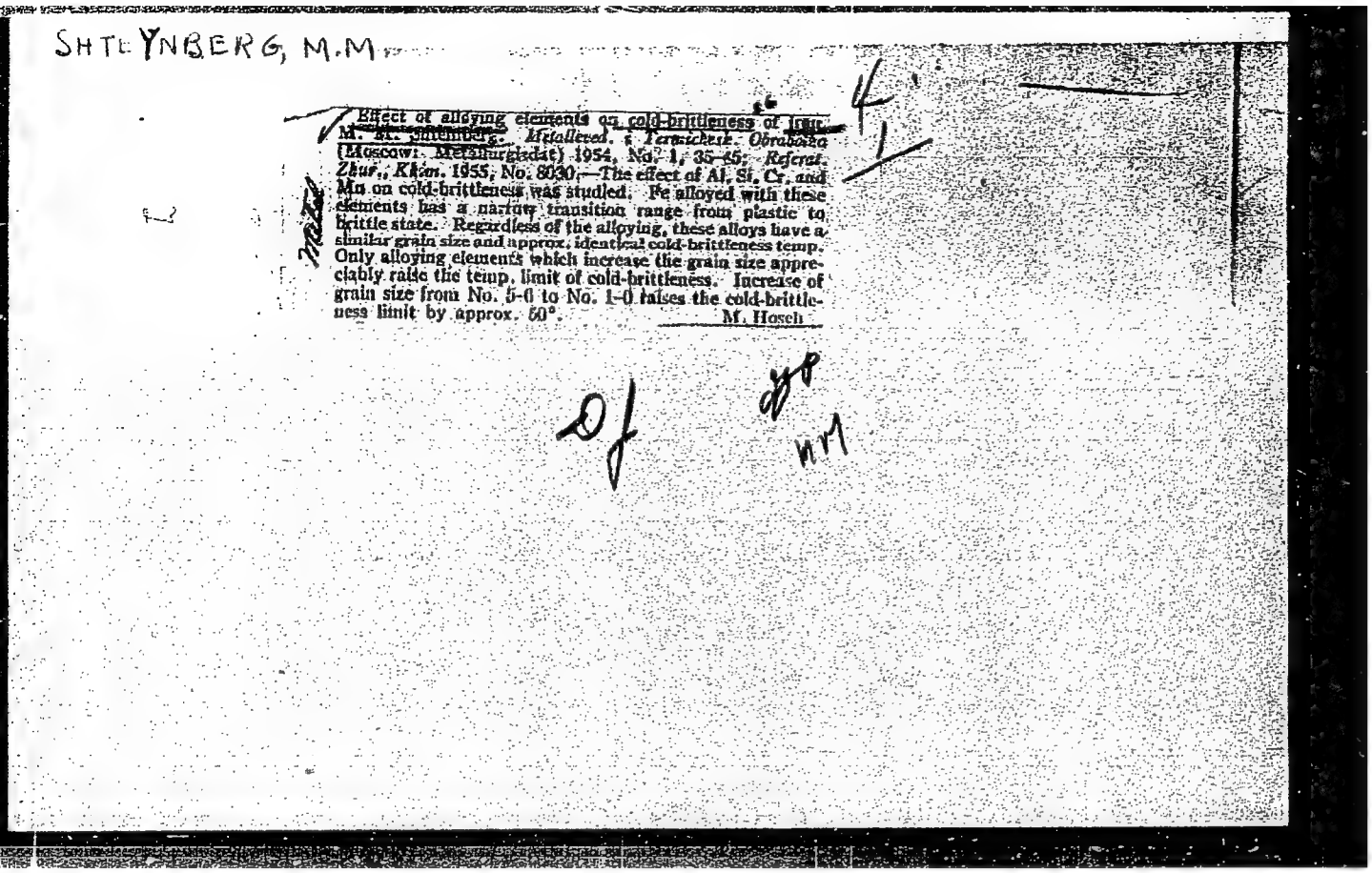
Coverage: Improvement of the mechanical properties of complexly alloyed steels is discussed. The first part of the study is related to the mechanical properties of complexly alloyed ferrite at equilibrium conditions. Data obtained are compared with early results of binary alloys. The

Mekhanicheskiye svoystva slozhnolegirovannogo ferrita AID 352 - I

second part of this study concerns complexly alloyed ferrite in the non-equilibrium state, and particularly at heating after cold plastic deformation and after tempering and annealing. 12 charts and 2 tables.

Purpose: For scientific workers
Facilities: None
No. of Russian and Slavic References: None
Available: Library of Congress.

2/2



SHTEYNBERG, M.M.

Effect of alloying elements on cold-brittleness of iron. M. M. Shteinberg. *Metalloved. i Termichesk. Obrabotka* (Moscow: Mashgiz) 1954, No. 1, 35–45; *Referat. Zhur., Khim.* 1955, No. 8030.—The effect of Al, Si, Cr, and Mn on cold-brittleness was studied. Fe alloyed with these elements has a narrow transition range from plastic to brittle state. Regardless of the alloying, these alloys have a similar grain size and approx. identical cold-brittleness temp. Only alloying elements which increase the grain size appreciably raise the temp. limit of cold-brittleness. Increase of grain size from No. 5-6 to No. 1-0 raises the cold-brittleness limit by approx. 50°.

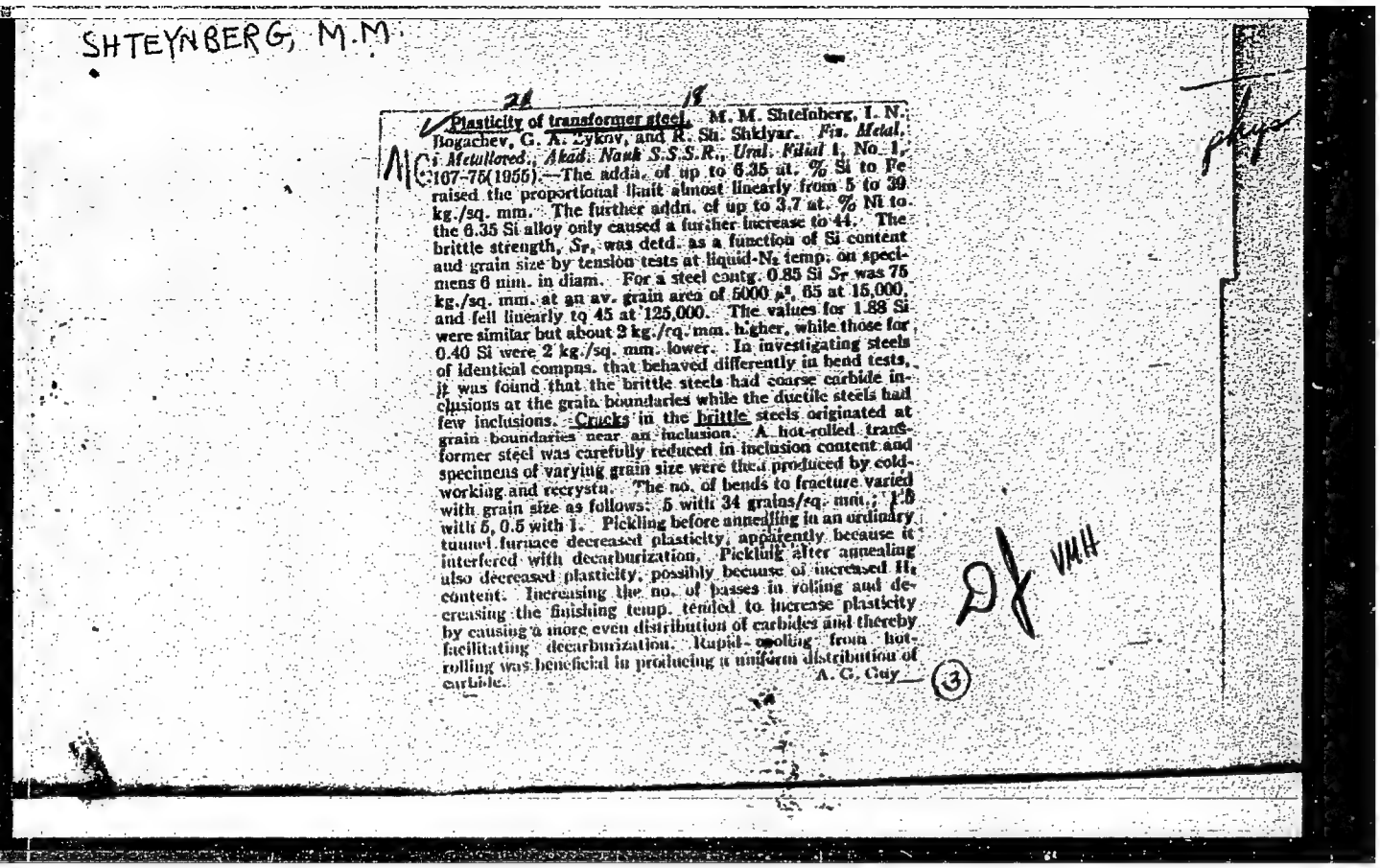
M. Hosch

POPOV, A. A., AND SHTEYNBERG, M. M.

Kinetics of Phase Transormation in Iron-Nickel Alloys
Tr. Uralsk. Politekhn. Inst., No 46, 1954, pp 25-33

Transformation kinetics of Fealloys wore investigated at usual heating speeds with 8, 15, and 19% Ni content. The temperatures of transformation were marked by magnetometric and dilatometric methods. It was confirmed that the transformation of gamma into alpha alloy in carbonless Fe-Ni alloys is similar to the martensite transformation in steels, although not so fast. (RZhFiz, No 5, 1955)

SO: Sum. No. 639, 2 Sep 55



SHTEYNBERG, M.M.

21 18

Plasticity of transformer steel. M. M. Shteinberg, I. N. Bogachev, G. A. Zykov, and R. Sh. Shklyar. *Fiz. Metal. i Metallored., Akad. Nauk S.S.S.R., Ural. Filial* 1, No. 1, 107-76(1955).—The addn. of up to 6.35 at. % Si to Fe raised the proportional limit almost linearly from 5 to 39 kg./sq. mm. The further addn. of up to 3.7 at. % Ni to the 6.35 Si alloy only caused a further increase to 44. The brittle strength, S_T, was detd. as a function of Si content and grain size by tension tests at liquid-N_2 temp. on specimens 6 mm. in diam. For a steel contg. 0.85 Si S_T was 75 kg./sq. mm. at an av. grain area of 5000 μ^2, 65 at 15,000, and fell linearly to 45 at 125,000. The values for 1.88 Si were similar but about 2 kg./sq. mm. higher, while those for 0.40 Si were 2 kg./sq. mm. lower. In investigating steels of identical compns. that behaved differently in bend tests, it was found that the brittle steels had coarse carbide inclusions at the grain boundaries while the ductile steels had few inclusions. Cracks in the brittle steels originated at grain boundaries near an inclusion. A hot-rolled transformer steel was carefully reduced in inclusion content and specimens of varying grain size were then produced by cold-working and recrystn. The no. of bends to fracture varied with grain size as follows: 5 with 34 grains/sq. mm., 1.5 with 5, 0.5 with 1. Pickling before annealing in an ordinary tunnel furnace decreased plasticity, apparently because it interfered with decarburization. Pickling after annealing also decreased plasticity, possibly because of increased H_2 content. Increasing the no. of passes in rolling and decreasing the finishing temp. tended to increase plasticity by causing a more even distribution of carbides and thereby facilitating decarburization. Rapid cooling from hot-rolling was beneficial in producing a uniform distribution of carbide.

A. G. Guy

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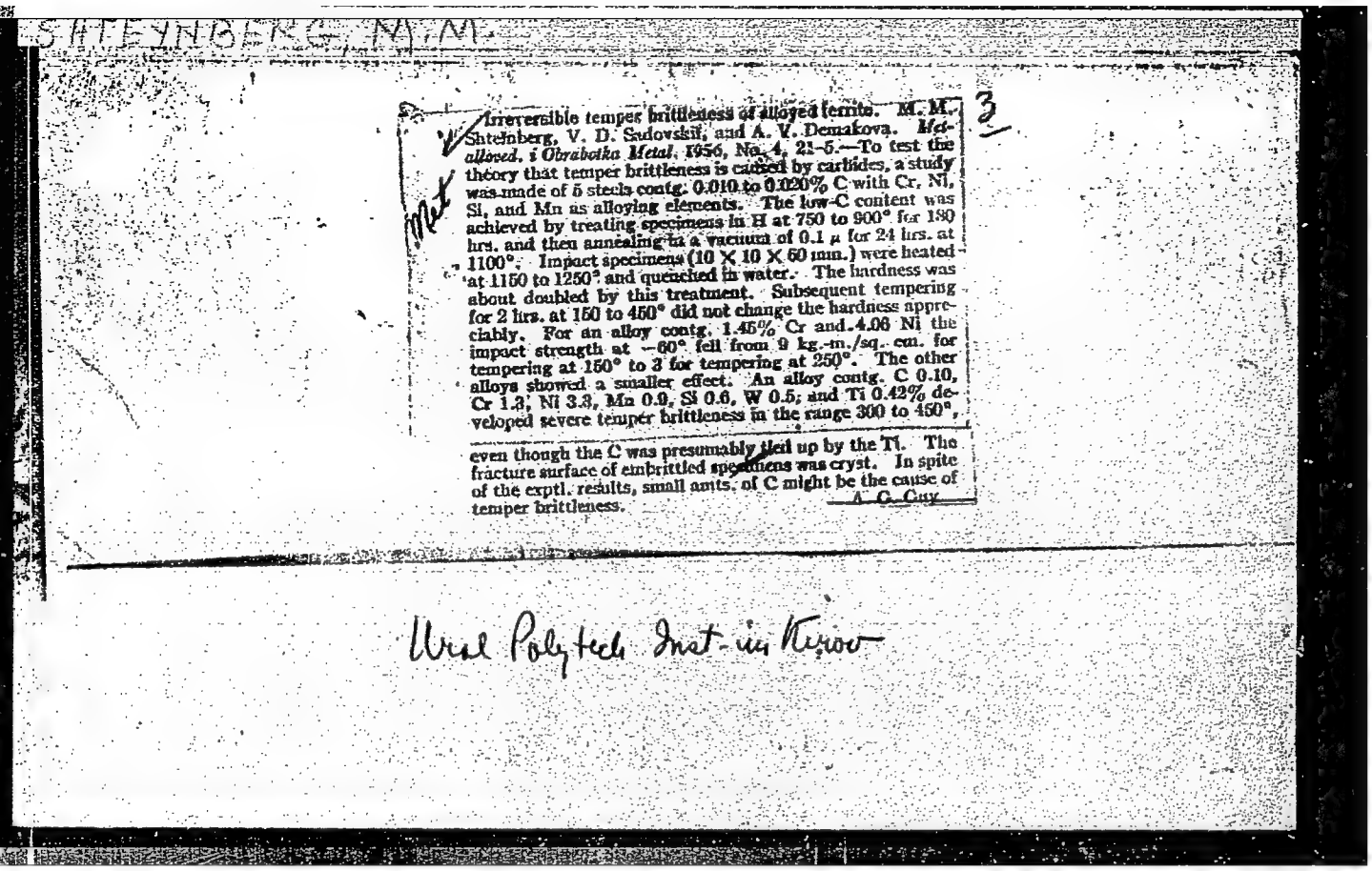

SHTEYNBERG, M. M.

3

Irreversible temper brittleness of alloyed ferrite. M. M. Shteinberg, V. D. Sadovskii, and A. V. Demakova. *Metalloved. i Obrabotka Metal.* 1956, No. 4, 21–5.—To test the theory that temper brittleness is caused by carbides, a study was made of 5 steels contg. 0.010 to 0.020% C with Cr, Ni, Si, and Mn as alloying elements. The low-C content was achieved by treating specimens in H at 750 to 900° for 180 hrs. and then annealing in a vacuum of 0.1 μ for 24 hrs. at 1100°. Impact specimens (10 × 10 × 60 mm.) were heated at 1150 to 1250° and quenched in water. The hardness was about doubled by this treatment. Subsequent tempering for 2 hrs. at 150 to 450° did not change the hardness appreciably. For an alloy contg. 1.45% Cr and 4.06 Ni the impact strength at −60° fell from 9 kg.-m./sq. cm. for tempering at 150° to 3 for tempering at 250°. The other alloys showed a smaller effect. An alloy contg. C 0.10, Cr 1.3, Ni 3.3, Mn 0.9, Si 0.6, W 0.5, and Ti 0.42% developed severe temper brittleness in the range 300 to 450°, even though the C was presumably tied up by the Ti. The fracture surface of embrittled specimens was cryst. In spite of the exptl. results, small amts. of C might be the cause of temper brittleness.

A. G. Guy

Ural Polytech Inst. in Kirov

SHTEYNBERG, M.M., kandidat tekhnicheskikh nauk, dotsent; SADOVSKIY, V.D., doktor tekhnicheskikh nauk, professor; DEMAKOVA, A.V.

Effect of cold plastic deformation on reversible and irreversible temper brittleness. Metalloved. i obr. met. no.6:26-35 Je '56. (MLRA 9:9)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.
(Steel--Cold working)

USSR / Phase Conversions in Solids. E-5

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9308

Author : Shteynberg, M.M., Sadovskiy, V.D., Demakova, A.V.
Inst : Ural'Polytechnic Institute USSR
Title : Investigation of the Irreversible Temper Brittleness of Alloyed Ferrite.

Orig Pub : Metallovedeniye i obrabotka metallo, 1956, 1956, No 4, 21-25

Abstract : Alloyed ferrite with a carbon content of 0.010 -- 0.020% is analogous with respect to the amount of alloying elements to structural alloyed steels (1.5% chromium and 3.5% nickel; 1% chromium, 1.5% manganese and 1.5% silicon), being susceptible to irreversible temper brittleness, which manifests itself in the same range of temper temperatures as for structural steels. The susceptibility to irreversible brittleness is observed also in that case, when the carbon in the steel is bound in titanium carbides and the steel loses

Card : 1/2

USSR / Phase Conversions in Solids. E-5

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9308

Abstract : its hardening ability. This indicates that the irreversible temper brittleness can be observed not only in the absence of residual austenite, but also in the absence of the martensitic phase in that sense, which is used with respect to the carbon-containing alloys.

Card : 2/2

USSR / Mechanical Properties of Crystals and Polycrystallic Compounds. E-9

Abs Jour : REf Zhur - Fizika, No 4, 1957, No 9463

Author : Shteynberg, M.M., Sadovskiy, V.D., Demakova, A.V.
Inst : Ural'Polytechnic Institute USSR
Title : Influence of Cold Plastic Deformation on the Irreversible and Reversible Temper Brittleness.

Orig Pub : Metallovedeniye i obrabotaka metallov, 1956, No 6, 26-35

Abstract : The brittleness that develops upon tempering hardened chrome-nickel iron (0.02% C, 1.45% Cr, and 4.06% Ni) in the interval from 300 to 350° (irreversible temper hardness) is annihilated by the action of plastic deformation, which increases considerably the impact viscosity of alloyed ferrite, worked into the state of irreversible temper brittleness. The plastic deformation, carried out by rolling at room temperature, also increases substantially the impact visco-

Card : 1/2

USSR / Mechanical Properties of Crystals and Polycrystallic Compounds. E-9

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 9463

Abstract : sity of structural alloyed steel (steels of the 30 KhGSA type were studied), worked into a state of reversible temper brittleness. The character and intensity of the influence of cold plastic deformation on the impact viscosity depend on the structural state of the alloy. The deformation increases the impact viscosity of the alloys, worked into a brittle state, and reduces or changes very little the impact viscosity of alloys worked into a viscous state. The similarity between the phenomena of irreversible temper brittleness and the deformation aging is emphasized and arguments are stated in favor of recognizing the generality of the nature of reversible and irreversible temper brittleness as phenomena that are due to the decay of the supersaturated α-solution.

Card : 2/2

AUTHORS: Shteynberg, M. M., Sabun, L. B. SOV/163-58-3-34/49

TITLE: The Relaxation of the Tension at the Grain Boundary of Alloyed Ferrite (Relaksatsiya napryazheniya po granitsam zeren legirovannogo ferrita)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 3, pp 207 - 214 (USSR)

ABSTRACT: The authors investigated which way alloyed elements influence the process of the relaxation of the tension at the grain boundary of α-iron. The alloying of ferrite leads to the increase of the activation energy. Different alloyed elements have a different effect on the activation energy. The following elements are arranged according to their effect on the activation energy: Co, Si, Mn, Cr, Mo. The activation energy is also influenced by copper, aluminium and tungsten, however, not by nickel. The highest values for the activation energy were obtained with alloys of ferrite with tungsten, silicon

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and manganese. In the alloys of iron with chromium and manganese (Khl, Kh1,6; Kh1,5N4; G 1,8) a new maximum of the internal friction A was found which is by 40-50° below the maximum of the internal friction B. A previous purification of the alloys from C, N and O as well as annealing of the alloy in hydrogen and in vacuum does, however, not remove the new maximum A. The occurrence of the maximum of internal friction is explained by the diffusion of Mn and Cr. An additional alloying with molybdenum completely removes the occurrence of the maximum as well as the internal friction A and decreases the activation energy at the grain boundary. The specific influence of molybdenum on the removal of the maximum of the internal friction A is caused by the influence of this metal on the distribution of Cr and Mn in the α-solid solution. There are 5 figures, 1 table, and 9 references, 4 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnical Institute)

The Relaxation of the Tension at the Grain Boundary of Alloyed Ferrite SOV/163-58-3-34/49

SUBMITTED: October 4, 1957

Card 3/3

18(7), 18(1)

AUTHORS: Shteynberg, M. M., Kir'yanova, N. P., Shklyar, R. Sh, Malinov, L. S.

SOV/163-58-4-32/47

TITLE: Investigation of Aging and Mechanical Properties of Beryllium Bronze (Issledovaniye stareniya mekhanicheskikh svoystv berilliyevoy bronzy)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 4, pp 189 - 192 (USSR)

ABSTRACT: The investigation concerned aging and mechanical properties of the beryllium bronze as well as the influence of cold plastic deformation on notch impact strength and hardness of the bronze. The X-ray structure investigation of the aging of beryllium bronze with 2.05% Be showed that decomposition of the α-solution can take place in two phases as well as in one phase. At aging temperatures of 200 and 250° decomposition occurs in two phases and is distinctly to be seen in the X-ray diagrams after aging for 2 hours, or 30 minutes, respectively. At an increase of the aging time up to 8 hours at 200°, and up to 4 hours at 250°, the characteristics of the one-phase decomposition begin to show at the same time.- As from 300°, decomposition shows one-phase character. An inc-

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rease in the lattice period of the α-solution is observed after aging for more than 6 minutes at 300°, for over 2 minutes at 350°, and for over 30 seconds at 400°.- The line of the new phase (γ-phase) is clearly visible in the X-ray diagrams only after aging at 350°.- At the temperatures of two-phase decomposition and at 300°, where the decomposition starts to be one-phase, the electric resistance increases as compared with the one in the hardened state.- Plastic cold deformation greatly speeds up the two-phase decomposition. An intense change in the mechanical properties of bronze begins at 200°, i.e. at the temperature where a two-phase decomposition of the α-solution is ascertained by the X-ray structure analysis. With an increase in the aging temperature, the proportionality limit, the breaking limit, the hardness and the initial factor of consolidation increase while the relative stretching, the compression of the cross section and the notch impact strength decrease. At an aging temperature of 350°, these properties reach their extreme values; at a further rise in temperature, they begin to change in the opposite direction.- The final factor of consolidation

Investigation of Aging and Mechanical Properties of Beryllium Bronze

SOV/163-58-4-32/47

(at the end of consolidation) undergoes rather little change in dependence on temperature and aging time. Aging for two hours at 350° gives the maximum strength properties. Retarded cooling after aging, as from 450°, leads to the mentioned increase in strength properties and to the reduction of plasticity and, in particular, of the notch impact strength, as compared with accelerated cooling in water.- At otherwise equal strength properties, a bronze aged at under 350° has a higher notch impact strength than a bronze aged at over 400°. Plastic deformation leads to a certain increase in notch impact strength, both before and after aging. The increase in notch impact strength is particularly great when the plastic deformation occurs before or after aging at the temperatures of two-phase decomposition (200 and 250°). There are 3 figures and 1 Soviet reference.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute)

SUBMITTED: October 4, 1957

Card 3/3

S/123/59/000/008/001/043
A004/A002

Translation from: Referativnyy zhurnal, Mashinostroyeniye, 1959, No. 8, p. 12, # 28674

AUTHORS: Shteynberg, M. M., Sokolkov, Ye. N., Varaksina, M. N.

TITLE: On the Problem of the Tendency of Metals to Brittle Failure

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1958, Vol. 68, pp. 54-58

TEXT: Plastic deformation which is effected by monoaxial static tension leads to a considerable increase in breaking strength, which was determined during tensile tests at the temperature of liquid nitrogen. The intensity of such an increase depends on the alloy composition and the initial structure. Systematic data on the dependence of breaking strength on preliminary plastic deformation may be used for a more founded estimation of the tendency of alloys to brittle failure. Besides, such data make it possible, in a number of cases, to determine the breaking strength of some steels by the extrapolation method.

B. A. M.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

SHTEYNBERG, M.M.; POKROVSKAYA, G.N.; CHEREMUKHINA, A.I.

Effect of iron, lead, and phosphorus additions and conditions of recrystallization following annealing on the mechanical properties of 162 brass. Trudy Ural. politekh. inst. no.68:59-70 '58.
(MIRA 12:7)
(Brass--Testing) (Annealing of metals) (Crystallization)

SHTEYNBERG, M. M. Doc Tech Sci -- (diss) "Structure and properties of alloyed ferrites." Sverdlovsk, 1959. 27 pp (Min of Higher and Specialized Secondary Education RSFSR. Ural Polytechnic Inst im S. M. Kirov), 150 copies. Bibliography: pp 26-27 (20 titles) (KL, 50-59, 126)

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S/137/61/000/011/094/123
A060/A101

18.1220

AUTHORS: Shteynberg, M. M., Kir'yanova, N. P., Shklyar, R. Sh., Malinov, L.S.

TITLE: Ageing kinetics and mechanical characteristics of beryllium bronze

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 11, 1961, 24, abstract 11I149 (V sb. "Probl. metalloved. i term. obrabotki", no. 2, Moscow - Sverdlovsk, Mashgiz, 1960, 143-167)

TEXT: By means of an X-ray structure investigation it was established that in the process of ageing of Be-bronze containing (in %): Be 2.05, Ni 0.40, Fe 0.08, Si 0.12, the decomposition of α-solid solution may take place both by the 2-phase (at 200 - 250°C) and by the single phase ($\geqslant$ 300°C) process. The lines of the new phase (γ) appear after ageing at 350°C. Ageing at temperatures $<$ 300°C raises the ρ of the bronze as result of the considerable faults in the crystal lattice. At the temperatures of the single phase decomposition one observes a considerable lowering of ρ with a simultaneous attainment of the maximum of the crushing stress: 2-hr ageing at 350° yields σ_b of 136 kg/mm^2, σ_p 115 - 120 kg/mm^2 and H_B 300 - 370. The ductility and a_k of the alloy are very low. The intense lowering of the strength characteristics, raising of the

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Ageing kinetics and mechanical characteristics ...

δ, ψ, a_k, and the sharp lowering of ρ after ageing at temperatures $\geqslant 400 - 450^{\circ}C$ are the result of coagulation of the separated particles of the γ-phase, of the enlargement of grains and grain blocks, and also of the coherence disturbance on the phase separation boundary. Slow cooling from a temperature $\geqslant 400^{\circ}C$ strengthens the alloy as compared to water hardening. At equal strength characteristics, ageing at temperatures $< 350^{\circ}$ yields a higher a_k than at $> 450^{\circ}C$. Cold plastic deformation of hardened alloy considerably accelerates the 2 phase decomposition and raises the a_k and the brittle strength. A double ageing at $250^{\circ}C$ with cold plastic deformation before the second ageing ensures the same strength characteristics as does ageing at $300^{\circ}C$, but the a_k is raised by a factor of 2. Lower strength characteristics but also a lower tendency to brittle failure are possessed by Be-bronze aged at 250 - $300^{\circ}C$ in combination with cold plastic deforming. Ageing at temperatures $> 400^{\circ}C$ is undesirable, since it lowers the brittle strength of the alloy.

G. Tyurin

[Abstracter's note: Complete translation]

Card 2/2

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S/148/60/000/007/007/015
A161/A029

AUTHORS: Shteynberg, M.M.; Zlatkina, A.S.; Volegov, L.P.

TITLE: The Kinetics of Alloy Ferrite Strength Drop

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, 1960, Nr 7, pp 117-124

TEXT: Information is given on an experimental investigation of ferrite alloyed with nickel, chromium, molybdenum, tungsten, and of two high-chromium ferrite steel grades (Table) subjected to external work hardening by cold rolling and internal hardening by quenching. Rolling with deformation to 90 and 30% was employed for alloy ferrite, and 60% for "X17" (Kh17) and "X25T" (Kh25T) ferrite steel. Data of 18 previous works /Ref 1-18/ were used in the study. Experiment details are included. It was concluded that alloy elements maintaining increased strength of metal at elevated temperature must raise the interatomic bond energy in the ferrite lattice. Manganese, chromium and particularly tungsten and molybdenum must increase the bond energy, whereas nickel and silicon have no perceptible effect on it. It is to be assumed that plastic

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S/148/60/000/007/007/015
A161/A029

The Kinetics of Alloy Ferrite Strength Drop

deformation and quenching reduces the near order degree /Ref 16/, and the interatomic bond energy must drop. Therefore, the lower limit of the recrystallization temperature threshold in alloyed ferrite rises less considerably than the upper limit, and the effect of alloy elements on the upper threshold limit position and the strength drop kinetics of ferrite must depend on the increase in the near order degree in the solution simultaneously with the strength drop, and on the temperatures up to which the near order is conserved./ Quantitative effect of alloy elements on the interatomic bond energy in the solid solution lattice may be measured by changes of the characteristic temperature. Data on the effect of alloying, machining and heat treatment on the characteristic temperature of ferrite are summarized in the work /Ref 16/. This temperature drops very considerably at plastic deformation of ferrite alloyed with chromium, and at high deformations the temperature is the same for chromium-alloyed and unalloyed iron /Ref 16/. To evaluate interatomic bonds more reliably, the X-ray analysis data must be supplemented by data of other investigation methods /Ref 18/, therefore the authors investigated also the dependence of the normal elasticity modulus on

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A161/A029

The Kinetics of Alloy Ferrite Strength Drop

temperature in annealed specimens of unalloyed iron and two alloys 180 mm long and of 5 mm in diameter. The modulus was measured by the dynamic method based on excitation of elastic vibration in the material. The modulus measurement error did not exceed 1.2%. The results show (Figure 4) that the normal elasticity modulus curve of the "Н4" (N4) alloy is placed lower, and of the "Х4,6" alloy (Kh4.6) higher than that of unalloyed iron. At a temperature rise above 600°C the normal elasticity modulus of N4 alloy drops more intensively than that of unalloyed iron and still more intensively than that of the Kh4.6 alloy. This result, in conjunction with the data obtained on the strength drop kinetics in alloy ferrite, shows that nickel not only does not increase but probably even decreases the interatomic bond energy in the ferrite lattice at recrystallization temperature. There are 4 figures and 18 references: 13 are Soviet and 5 English.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnical Institute)

SUBMITTED: March 16, 1959

Card 3/3

S/126/61/012/004/016/021
E193/E383

AUTHORS: Mirmel'shteyn, V.A. and Shteynberg, M.M.

TITLE: Effect of lanthanum on temper brittleness of a chromium-nickel-manganese steel

PERIODICAL: Fizika metallov i metallovedeniye, v. 12, no. 4, 1961, 613 - 615

TEXT: In spite of the wide application of rare-earth metals as deoxidizing, desulphurizing and modifying agents, the side effects of these alloying additions on the properties of steel have not yet been systematically studied - hence the present investigation, whose object was to study the effect of lanthanum on some properties of steel 38ХГН (38KhGN) with a slightly reduced carbon content. The experimental steels were melted in a 30-kg capacity high-frequency induction furnace, ferrosilicide being used as a deoxidizing agent. In calculating the quantity of lanthanum added, 30% was allowed for burned-out losses. The chemical analyses of the experimental melts are given in a table, in which the lanthanum content is nominal.

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Effect of lanthanum ...

The ingots were given a homogenizing treatment at 1 150 °C and forged into rods. The results of various tests can be summarized as follows.

1) Neither the kinetics of the austenitic transformation during both isothermal treatment and continuous cooling, nor the mechanical properties of the steel after hardening and high-temperature tempering are affected by the presence of La in the concentration range (0.05 - 0.25%) studied.

2) La additions decrease the austenitic grain size and raise the temperature at which intensive grain growth begins.

3) The tendency to temper brittleness of the steel studied is greatly reduced by additions of La. The results of tests carried out on specimens, oil-quenched from 930 °C and tempered for 1.5 hours at 625 °C, are reproduced graphically. In Fig. 1 the austenitic grain size ($\mu^2 \times 10^3$ - top curve) and the room temperature impact strength (a_K, kgcm/cm^2 [Abstracter's note - probably a misprint - should be "kgm/cm^2"], bottom curves) of

Effect of lanthanum ....

hardened and tempered specimens is plotted against the La content (%), Curves 1 and 2 relating, respectively, to test pieces oil-quenched or furnace-cooled after tempering. In Fig. 2 a_K of hardened and tempered specimens is plotted against the test temperature (^oC), the La content being indicated by each curve, the circles and dots relating, respectively, to specimens oil-quenched and furnace-cooled after tempering.
4) As can be seen from data reproduced in Fig. 1, the higher resistance of La-bearing steel to temper brittleness cannot be attributed to the effect of this addition on the austenitic grain size.
5) The ductile-to-brittle transition temperature is depressed by La, particularly when present in relatively high concentrations (approximately 0.25%).
6) La affects the etching characteristics of steel in that with increasing La content it becomes increasingly difficult to reveal the austenitic grain boundaries. I. Khil'kevich participated in this work. There are 2 figures, 1 table and 2 Soviet references.

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S/126/61/012/004/016/021
E193/E383

Effect of lanthanum ....

ASSOCIATIONS. Ural'skiy zavod tyazhelogo mashinostroyeniya im. S. Ordzhonikidze (Ural Plant of Heavy Machinery imeni S. Ordzhonikidze)
Ural'skiy politekhnicheskiy institut im. S.M. Kirova (Ural Polytechnical Institute im. S.M. Kirov)

SUBMITTED: June 24, 1961

Card 4/6

POPOV, Aleksandr Artem'yevich; GEL'D, P.V., red.; SHTEYNBERG, M.M., red.; SYRCHINA, M.M., red. izd-va; MAL'KOVA, N.T., tekhn. red.

[Theoretical basis of the chemical and heat treatment of steel] Teoreticheskie osnovy khimiko-termicheskoi obrabotki stali. Sverdlovsk, Metallurgizdat, 1962. 118 p. (MIRA 15:10)
(Steel--Heat treatment) (Diffusion coatings)

33463
S/129/62/000/001/006/011
E073/E483

18.1120

AUTHORS: Shteynberg, M.M., Doctor of Technical Sciences, Professor; Sabun, L.B., Engineer and Shabashova, T.S.

TITLE: Influence of thermomechanical treatment on cutting-edge stability and toughness of high-speed cutting steels

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.1, 1962, 29-30 and 35-37 + 1 plate

TEXT: The influence of thermomechanical treatment on the properties of high-speed cutting steels has been little investigated. Therefore, the authors studied this problem on heats produced in a 30 kg capacity high-frequency furnace. The chemical compositions of the investigated steels were as follows (%)

	C	W	Cr	V	Mo	Co
Р9 (R9)	0.87	9.2	4.0	2.10	0.20	-
Р18 (R18)	0.80	18.1	4.2	1.20	0.20	-
Р9К5 (R9K5)	0.80	10.2	4.03	1.76	0.16	4.68
Р9К10 (R9K10)	0.82	8.6	4.0	1.84	0.11	10.24

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Influence of thermomechanical ...

The ingots were forged into 15 x 15 mm rods, which were subjected to thermomechanical treatment. The austenizing temperature was 1270°C for steel R18 and 1250°C for other materials. Preliminary heating was in a salt bath at 860°C and the austenite was super-cooled to the desired temperature in a saltpetre bath. Plastic deformation (5 to 30% reduction) was by forging in a test rig which ensured that the cross-section of the blank remained square. The blank was hit along two adjacent sides and following that it was oil-quenched. The same heat-treatment was applied simultaneously to pilot specimens not subjected to plastic deformation. In addition to investigating the cutting properties, hot hardness, toughness and structure, magnetometric investigations were carried out on the steel R9. It was found that thermomechanical treatment increased the service life of cutting edges of the steels R9 and R18 but had little effect on the performance of cutting edges of Co-containing high-speed steels. The effect of thermomechanical treatment was most pronounced in material deformed at 400°C. The actual increase in service life for a reduction of 15% was as follows:

Influence of thermomechanical ...

Deformation temperature, °C	Increase (or decrease) in service life, %
197	-8
170	-12
228	8
228	8
229	8
228	8
251	20

The curve illustrating the relationship between the service life of a cutting edge and the degree of plastic deformation given to steel during thermomechanical treatment has a maximum; for the deformation range studied the highest service life of the cutting edge was obtained in the case of 15% reduction. Thermomechanical treatment does not appreciably influence hot hardness. The increased service life was attributed to increased wear-resistance

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Influence of thermomechanical ...

of the cutting edge; this increase was most pronounced when cutting materials of high hardness; practically no increase in service life was observed in machining austenitic steels. The thermomechanical treatment improved appreciably toughness of steel in static bending; it also brought about refinement of the martensite grain and formation of a texture. Magnetometric tests have shown that on increasing the reduction from 5 to 20 - 30%, the martensitic point for the residual austenite during tempering is depressed 20 to 30°C below that for undeformed steel. The thermomechanical treatment had little influence on the completeness of the transformation of the residual austenite during tempering. There are 5 figures, 4 tables and 9 references: 7 Soviet-bloc and 2 non-Soviet-bloc. The two references to English language publications read as follows: Ref.1: D.J.Schmatz, J.C.Shyne, V.F.Zackay. Metal Progress, v.76, no.3, 1959; Ref.8: R.F.Harvey. Steel, v.147, 1960.

ASSOCIATION: Ural'skiy politekhnicheskiy institut
(Ural Polytechnical Institute)
Uralmashzavod

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S/126/62/014/006/003/020
E111/E151

AUTHORS: Shteynberg, M.M., Zlatkina, A.S., and Schastlivtseva, I.K.

TITLE: Investigation of softening and inter-atomic bond energy in complex-alloyed ferrite

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.6, 1962, 820-827

TEXT: Published evidence suggested that at high degrees of plastic deformation short-range order in ferrite alloyed with tungsten or molybdenum is weakened to a considerably lesser extent than is chromium ferrite. It was therefore important to elucidate to what extent a second alloying element can retard the softening of chromium ferrite after high degrees of deformation, especially in the early stages. The work showed that with the alloys studied both retardation and acceleration could result. The greatest retardation is produced by molybdenum, tungsten and niobium, with cobalt having appreciably less effect. Combinations of molybdenum with tungsten or with tungsten and cobalt are particularly effective retardants. A low (0.34%) concentration vanadium

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accelerates softening, but a high concentration (4.24%) retards it. Alloying with silicon, manganese and aluminium has no marked effect. A tungsten:molybdenum ratio of about 3:1 gave considerable retardation in an alloy with about 3% tungsten. The retardation of softening is due to the increase by the elements concerned of the recrystallisation threshold temperature and the activation energy. Alloys with approximately equal softening activation energies and threshold recrystallisation temperatures can at a given temperature soften at different rates and to different extents. From such information, confirmed by results of measurements of the effect of temperature on the moduli of normal elasticity and on true coefficients of linear expansion, the following indirect conclusions can be drawn about inter-atomic bond energies in chromium ferrite: the energies increase on alloying with cobalt, molybdenum, tungsten, niobium and large additions of vanadium, but small additions of vanadium have the reverse effect.
There are 5 figures.
ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S.M. Kirova
(Ural Polytechnical Institute imeni S.M. Kirov)
Card 2/2
SUBMITTED: June 7, 1962

BLANTER, M.Ye., prof., doktor tekhn.nauk; SHTEYNBERG, M.M., prof., doktor tekhn. nauk, retsenzent; FRID, L.I., inzh., red.; SOKOLOVA, T.F., tekhn. red.

[Metallography and the heat treatment of metals] Metallovedenie i termicheskaia obrabotka. Moskva, Mashgiz, 1963. 416 p. (MIRA 16:8)
(Metallography) (Metals--Heat treatment)

SHTEYNBERG, M.M.

AID Nr. 975-1 23 May

THERMOMECHANICAL TREATMENT OF HIGH-SPEED STEELS (USSR)

Shteynberg, M. M., L. B. Sabun, S. P. Shabashov, and M. A. Smirnov. Metallovedeniye i termicheskaya obrabotka metallov, no. 4, Apr 1963, 41-48. S/129/63/000/004/010/014

The effect of low- and high-temperature thermomechanical treatment (LTTT and HTTT, respectively) on the cutting properties and ductility of P9 (0.87% C, 9.0% W, 4% Cr, 2.10% V, 0.20% Mo), P9Ф5 (1.54% C, 10.15% W, 3.64% Cr, 4.86% V, 0.20% Mo), and P10K5Ф5 (1.46% C, 11.26% W, 4.44% Cr, 4.95% V, 0.19% Mo, 6.0% Co) high-speed steels has been studied at the Ural Polytechnic Institute and the Ural Heavy Machinery Plant. It was determined that LTTT (ausforming) enhances the tool life of P9 steel but has little effect on the tool life of the other two steels. The effect of LTTT on P9 steel was greatest at a temperature of 400°C with a 15% reduction. Under these conditions the wear resistance of the treated cutting tools was more than doubled. HTTT carried out at 900°C with a 15% reduction had less

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AID Nr. 975-1 23 May

THERMOMECHANICAL TREATMENT [Cont'd] S/129/63/000/004/010/014

effect on the P9 steel and was even detrimental to the other two steels. Although both LTTT and HTTT improved the ductility of all three steels, the HTTT cannot be recommended for the P9Ф5 and P10К5Ф5 steels because it resulted in a considerable decrease in their cutting properties. The amount of residual austenite in hardened P9 steel decreases in LTTT when reduction is less than 5% and increases when reduction is above 5%. In the HTTT of hardened P9 steel the amount of residual austenite decreases as deformation is increased. Neither treatment has a noticeable effect on the austenite content in the other two steels. [SS]

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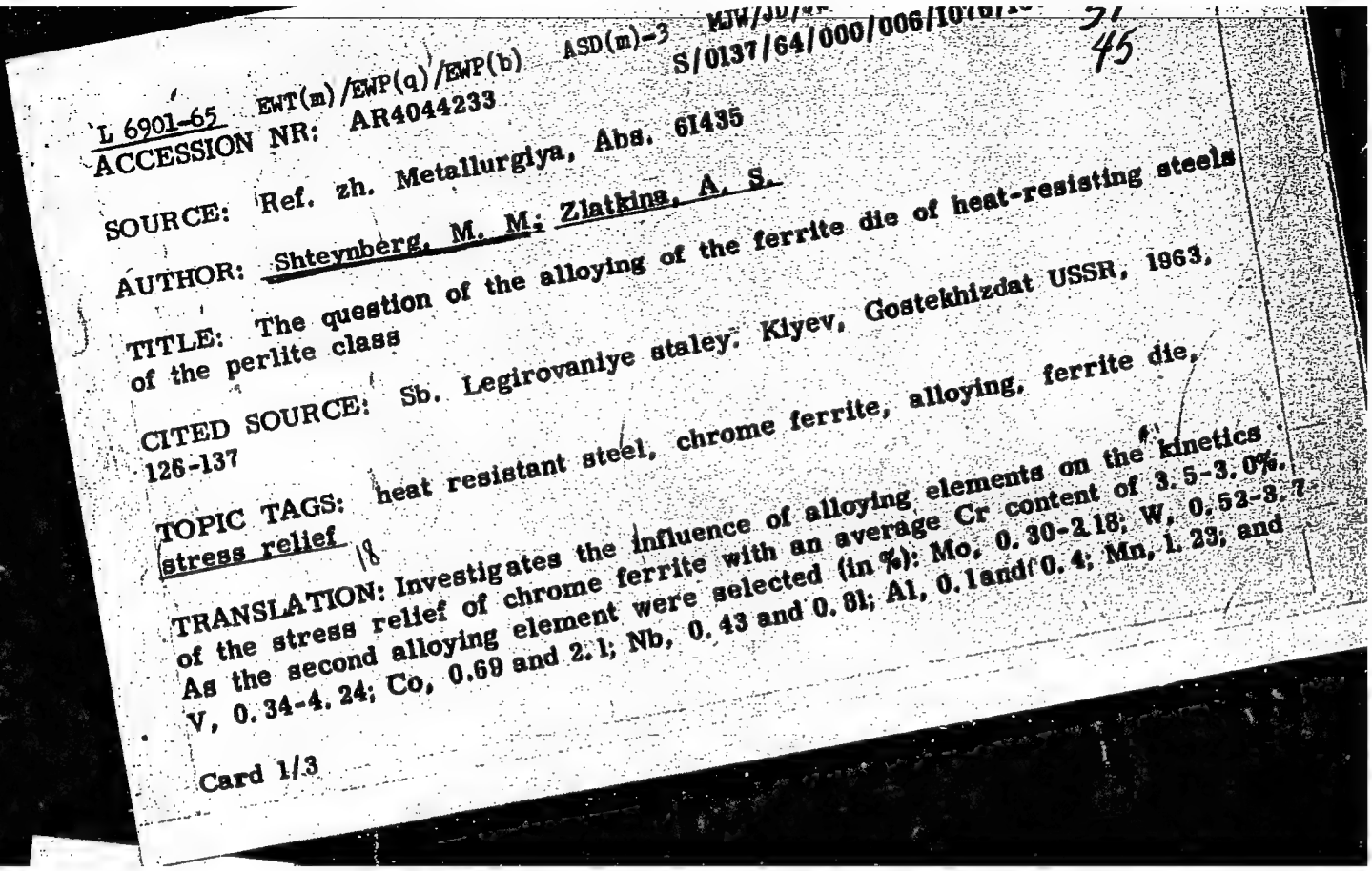
SHTEYNBERG, M.M.; MIRMEL'SHTEYN, V.A.; KODES, Ye.S.

Temper brittleness of structural steel with lanthanum.
Metalloved. i term. obr. met. no.8:6-10 Ag '63. (MIRA 16:10)

1. Ural'skiy politekhnicheskiy institut i Nauchno-issledovatel'skiy konstruktorsko-tekhnologicheskiy institut tyazhelogo mashinostroyeniya Ural'skogo zavoda tyazhelogo mashinostroyeniya imeni Sergo Ordzhonikidze.



L 6901-65 EWT(m)/EWP(q)/EWP(b) ASD(m)-3 MJW/JD/JG S/0137/64/000/006/I0[illegible] 21 45

ACCESSION NR: AR4044233

SOURCE: Ref. zh. Metallurgiya, Abs. 6I435

AUTHOR: Shteynberg, M. M.; Zlatkina, A. S.

TITLE: The question of the alloying of the ferrite die of heat-resisting steels of the perlite class

CITED SOURCE: Sb. Legirovaniye staley. Kiyev, Gostekhizdat USSR, 1963, 126-137

TOPIC TAGS: heat resistant steel, chrome ferrite, alloying, ferrite die, stress relief 18

TRANSLATION: Investigates the influence of alloying elements on the kinetics of the stress relief of chrome ferrite with an average Cr content of 3.5-3.0%. As the second alloying element were selected (in %): Mo, 0.30-2.18; W, 0.52-3.7; V, 0.34-4.24; Co, 0.69 and 2.1; Nb, 0.43 and 0.81; Al, 0.1 and 0.4; Mn, 1.23; and

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L 6901-65
ACCESSION NR: AR4044233

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cess (~30,000-90,000 cal/mole for different alloys). In the calculation it is assumed that the rate of stress relief is an exponential function of temperature, and that the pre-exponential factor for the investigated range of stress relief temperatures is a constant. The activation energy increases with stress relief for all alloys. The process of stress relief turns out to be retarded for those alloys whose activation energy has the highest value, although there is no exact quantitative correspondence in this case. Five illustrations, bibliography: 6 references.

SUB CODE: MM, AS ENCL: 00

Chromium Steel

Card 3/3

SHTEYNBERG, M.M.; FARAFONOV, V.K.; OVDINA, N.K.

Effect of tungsten, molybdenum, and vanadium on the recovery of chromium-nickel austenite. Fiz. met. i metalloved. 15 no.2: 229-233 F '63. (MIRA 16:4)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
(Chromium-nickel steel—Metallurgy)

SHTEYNBERG, M.M.; SABUN, L.B.; SHABASHOV, S.P.

Quick partial cooling of rapid steel during hardening as a method of increasing its cutting ability. Fiz.met.i metalloved. 15 no.3:475-477 Mr '63. (MIRA 16:4)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova i Ural'skiy zavod tyazhelogo mashinostroyeniya imeni S.O. Ordzhonikidze.

(Tool steel--Hardening)

GEL'D, P.V.; GOL'TSOV, V.A.; SHTEYNBERG, M.M.

Effect of intraphase hardening on hydrogen absorption in manganese austenite. Fiz. met. i metalloved. 16 no.3:394-402 S '63. (MIRA 16:11)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

SHTEYNBERG, M.M.; ZLATKINA, A.S.; TRIFONOV, G.A.; ZHURAVLEV, L.G.

Effeft of addition elements on the heat-resistance of chromium ferrite. Fiz. met. i metalloved. 16 no.3:467-473 S '63. (MIRA 16:9)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

SHTEYNBERG, M.M.; ZLATKINA, A.S.; ZHURAVLEV, L.G.

Effect of addition elements on the mechanical properties of chromium ferrite at high temperatures. Fiz. met. i metalloved. 16 no.3:474-479 S '63. (MIRA 16:11)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

GEL'D, P.V.; GOL'TSOV, V.A.; RYABOV, R.A.; SHTEYNBERG, M.M.

Interaction of the parameters of hydrogen absorption by precipitation-hardened austenite. Fiz. met. i metalloved. 16 no.4:610-611 O '63. (MIRA 16:12)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

SHTEYNBERG, M.M.; TRIFONOV, G.A.

Effect of rapid partial cooling on the heat-resistant properties of austenitic steel. Fiz. met. i metalloved. 16 no.6:923-925 D '63. (MIRA 17:2)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

ACCESSION NR: AT4042636 S/3104/64/000/005/0038/0047

AUTHOR: Shteynberg, M.M.(Doctor of technical sciences), Mirmel'shteyn, V. A. (Engineer), Kodes, Ye. S. (Engineer), Chechulin, I. P. (Engineer)

TITLE: Effect of lanthanum on temper brittleness of structural steel

SOURCE: Ural'skiy mashinostroitel'ny*y zavod, Sverdlovsk. Nauchno-issledovatel'skiy institut tyazhelogo mashinostroyeniya. Proizvodstvo krupny*kh mashin, no. 5, 1964. Metallovedeniye i termicheskaya obrabotka (Metallography and heat treatment); sbornik statey, 38-47

TOPIC TAGS: lanthanum, structural steel, chromium nickel manganese steel, alloy steel, steel temper brittleness, molybdenum, steel brittleness, temper brittleness, steel tempering

ABSTRACT: A previously published paper by V. A. Mirmel'shteyn and M. M. Shteynberg showed that lanthanum depresses the reversible temper brittleness of 30KhGN chromium-nickel manganese structural steel. This article considers the problem in greater detail. Tests were performed with five samples: the first was used as a standard; the second,

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ACCESSION NR: AT4042636

third and fourth contained 0.15, 0.25 and 0.35% lanthanum, considering a 30% loss; the fifth sample has 0.25% molybdenum in order to compare its effect on temper brittleness with that of lanthanum. Lumps of lanthanum were added to the molten alloy with intensive mixing. All samples were homogenized at 1150C and then normalized and passed through high tempering, after which they were hardened. One part of the samples was hardened from a temperature of 870C in a salt bath for 20 minutes. The second part was subjected to hardening with overheating in a barium chloride bath. The samples hardened in the salt bath had a grain size of 8 (standard scale), the other group had a grain size of 6, except for sample IV (grain size 5). The samples were then tested at temperatures from +60 to -80C. Analysis of the tests showed that lanthanum lowers the tendency of 30KhGN chromium-nickel-manganese structural steel toward reversible temper brittleness, preventing fracture between the grains and significantly increasing the viscosity temperature safety factor. The best results were obtained with about 0.2% lanthanum. The results of the tests described in the present article corroborate those mentioned in the cited one by V. A. Mirmel'shetyn and M. M. Shteynberg. The authors recommend additional work on the

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ACCESSION NR: AT4042636

following problems: a) the influence of lanthanum on other grades of steel; b) the best flow process for melting and deoxidation of steel and introduction of lanthanum; c) the influence of lanthanum on the temper brittleness of steel; d) the combined influence of lanthanum and molybdenum as well as lanthanum and tungsten on the temper brittleness of steel; e) influence of lanthanum on other properties of steel connected with grain size, in particular durability at high temperatures. Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: Nauchno-issledovatel'skiy institut tyazhelogo mashinostroyeniya, Ural'skiy mashinostroitel'ny*y zavod, Sverdlovsk (Scientific Research Institute for Heavy Machine Building, Urals Machine Design Plant)

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 000

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